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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,076	01/11/2002	H. Ufuk Alpay	064441.0223	6503

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EXAMINER


MOHAMEDULLA, SALEHA R

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/044,076	Applicant(s) ALPAY ET AL. 
	Examiner Saleha R. Mohamedulla	Art Unit 1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-19 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-19 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-8, 10-19 and 23-26 are pending. The 35 U.S.C. 102 and 35 U.S.C. 103 rejections of record are withdrawn in view of Applicant's amendments and remarks.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 4, 8, 12, 15, 17, 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by US# 6,309,781 to Gemmink et al.

Gemmink teaches a damage resistant photomask. In Figure 1, Gemmink teaches a photomask 1 comprising a base plate 2 of a radiation-transmitting and electrically insulating material, which in this example is an approximately 5 mm thick plate of quartz glass. A first side 3 of this base plate 2 is provided with a layer of an electroconductive mask material 4. In this example, said layer is a customary, approximately 100 nm thick layer of chromium whose surface is provided with an approximately 10 nm thick anti-reflecting layer of chromium oxide (not shown). In the layer of mask material 4, a mask pattern 6 to be imaged is formed within a closed edge 5 of said material. (col. 2, line 65- col. 3, line 10). Therefore, Gemmink teaches a photomask pattern with a plurality of features forming an optical absorber, because chromium is an optical absorber. As is shown and described, the pattern of chromium includes clear and opaque areas. The figure shows that this was performed by forming a the chromium layer and

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then removing portions of the layer. The photomask 1 is entirely enveloped in a protective layer 9 of radiation-transmitting, electroconductive material. Because layer 9 is a transparent electroconductive material, it is a dielectric material. Thus, the mask pattern 6 is incorporated in a Faraday cage, which causes charging of the mask pattern 6 to be precluded. As a result, large voltage differences between parts 7, 8 of the mask pattern 6 and the edge of mask material 5 are precluded. The protective layer 9 protects the mask 1 against damage which may be caused by electrostatic discharges (Electro-Static-Discharge). (col. 3, lines 20-30). Therefore, Gemmink teaches forming a transparent protective coating operable to prevent the features from being damages by electrostatic discharge. Gemmink teaches that the protective layer may be made of polyacetylene (col. 4, lines 15-20). The substrate is made of quartz, therefore, Gemmink teaches that the protective layer has a second refractive index greater than the first refractive index, because polyacetylene has a greater refractive index than quartz.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over US# 6,309,781 to Gemmink et al. in view of US# 6,544,693 to Levinson et al.

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Gemmink teaches the limitations of claim 12 discussed above. Gemmink does not teach a pellicle attached over the protective layer. Levinson teaches a pellicle that is attached to a mask or reticle. The pellicle is generally comprised of a pellicle frame and a membrane. The pellicle frame may be comprised of one or more walls, which is securely attached to a chrome side of the mask or reticle.

The references are analogous art as they are drawn to exposure masks. It would have been obvious to one of ordinary skill in the art to use the pellicle coating of Levinson in the mask of Gemmink in order to reduce the likelihood that particles might migrate into an exposure area of the mask (col. 1, lines 50-55).

5. Claims 2, 3, 5-7, 10, 11, 13, 14, 16, 19 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US# 6,309,781 to Gemmink et al. in view of US# 6,261,725 to Tzu et al.

Gemmink teaches the limitations discussed above. Gemmink does not teach the recited materials and electrical resistivity. Gemmink also does not teach an etched substrate.

Tzu teaches a photomask and a method of making the mask. Tzu teaches that phase shift photomasks for use with deep ultraviolet (DUV) exposure radiation are generally formed employing quartz substrates with high DUV transmittance for the clear areas and a phase shift DUV absorbing patterned layer formed of an etchable translucent material such as a spin-on-glass (SOG) dielectric material, for example (col. 2, lines 15-25). Tzu teaches in Figure 4 a mask with a quartz substrate with an engraved pattern 12. The mask includes a phase shift layer 14 (col. 2, lines 60-67). The phase shift layer can be silicon dioxide (col. 5, lines 20-30). The phase shift layer is formed using an aqueous suspension therefore, the layer is made by

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chemical vapor deposition. After the phase shift layer is formed, Tzu teaches a gas phase subtractive etching method. Therefore, Tzu teaches forming a photomask pattern on a substrate and forming a transparent protective coating on the pattern made of spin-on-glass. Spin-on-glass inherently has an electrical resistivity of at least 10 ohm meters. Tzu also teaches that the substrate is etched, therefore, Tzu teaches removing material from the substrate to form trenches in the substrate. Because Tzu shows in the figures that the pattern layer is flat, the pattern layer is planarized. In addition, Tzu does teach that the phase shift layer is formed using an aqueous suspension (col. 5, lines 20-30). The suspension would be dried to form a hardened silicon dioxide layer that functions as a mask layer, therefore, Tzu discloses curing the material.

The references are analogous art as they are drawn to exposure masks. It would have been obvious to one of ordinary skill in the art to include the materials and etched substrate of Tzu in the mask of Gemmink in order to increase the flexibility of the mask so that it can be used to achieve more defined phase angles to achieve a better patterning resolution (col. 2, lines 48-55).

Response to Arguments

6. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

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Action is Final

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Saleha Mohamedulla whose telephone number is (571) 272-1387. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Patent Examiner
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May 3, 2004